

IN THE CLAIMS

- 1 (Currently Amended). A method comprising:
- forming a lower electrode having an a upper and a lower side;
 - covering the upper side of said lower electrode with a protective layer; and
 - forming a phase change material over said upper side of said lower electrode such that said protective layer isolates said phase change material completely from said lower electrode.
- 2 (Original). The method of claim 1 further comprising:
- defining a singulated opening;
 - forming a cup-shaped phase change material in said opening; and
 - forming a thermally insulating material in the cup-shaped phase change material.
- 3 (Original). The method of claim 2 including defining said phase change material using a planarization process.
- 4 (Original). The method of claim 3 including defining said phase change material using a chemical mechanical planarization technique.
- 5 (Original). The method of claim 2 including defining a sidewall spacer in said singulated opening.
- 6 (Original). The method of claim 5 including defining an electrode in said opening.
- 7 (Original). The method of claim 6 including using said sidewall spacer to define the cup-shape of said phase change material.
- 8 (Original). The method of claim 6 including forming a base layer over a substrate and forming said lower electrode over said base layer.

9 (Original). The method of claim 1 including sequentially forming said lower electrode and then said protective layer.

10 (Original). The method of claim 9 including etching said lower electrode and said protective film using the same mask.

Claims 11-30 (Canceled).

31 (Previously Presented). The method of claim 1 including forming the lower electrode and covering the lower electrode with a protective layer in the same chamber.

32 (Previously Presented). The method of claim 31 including depositing the lower electrode and the protective layer in the same deposition chamber.

33 (Previously Presented). The method of claim 32 including depositing the electrode and protective layer in the same deposition chamber without venting back to atmosphere.

34 (Previously Presented). The method of claim 1 including forming the protective layer of an insulator.

35 (Previously Presented). The method of claim 34 including forming the protective layer of a material in the form of silicon nitride.

36 (Previously Presented). The method of claim 35 including forming the silicon nitride in the form of Si_3N_4 .

37 (Previously Presented). A method comprising:
forming a lower electrode and a protective layer over said lower electrode of a phase change memory in the same deposition chamber without venting back to atmosphere.

Claims 38-40 (Canceled).

41 (Previously Presented). The method of claim 37 including forming the protective layer of an insulator.

42 (Previously Presented). The method of claim 41 including forming the protective layer of a material in the form of silicon nitride.

43 (Previously Presented). The method of claim 42 including forming the silicon nitride in the form of Si_3N_4 .

44 (Currently Amended). A method comprising:
forming an electrically insulating protective layer completely covering ~~over~~ a conductive lower electrode of a phase change memory.

45 (Previously Presented). The method of claim 44 including forming the lower electrode and covering the lower electrode with a protective layer in the same chamber.

46 (Previously Presented). The method of claim 45 including depositing the lower electrode and the protective layer in the same deposition chamber.

47 (Previously Presented). The method of claim 46 including depositing the electrode and protective layer in the same deposition chamber without venting back to atmosphere.

48 (Previously Presented). The method of claim 44 including forming the protective layer of an insulator.

49 (Previously Presented). The method of claim 48 including forming the protective layer of a material in the form of silicon nitride.

50 (Previously Presented). The method of claim 49 including forming the silicon nitride in the form of Si_3N_4 .